Unit-2 Mastery Assessment (version 623)

Question 1 (10 points)

Let f represent a function. If $f[48] = 24$, then there exists a knowable solution to the equation below.

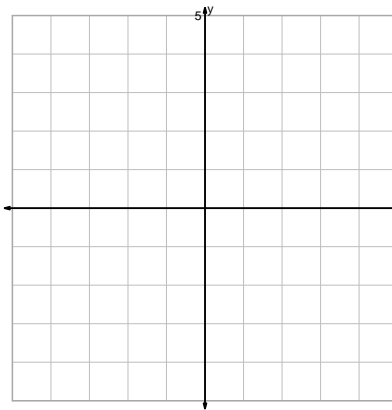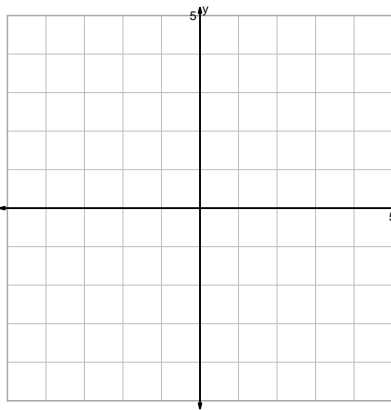$$y = \frac{f[3x - 45]}{6} + 37$$

Find the solution.

$x =$
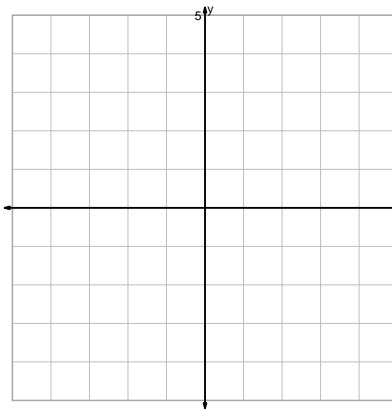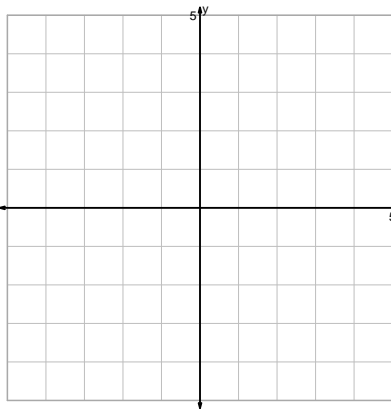
$y =$

Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

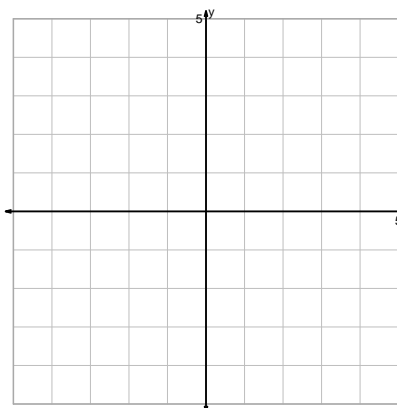$y = \log_2\left(\dfrac{x}{2}\right)$
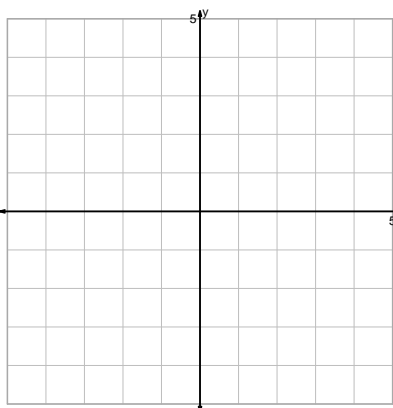

$y = 2 \cdot x^3$

$y = \left(x - 2\right)^2$

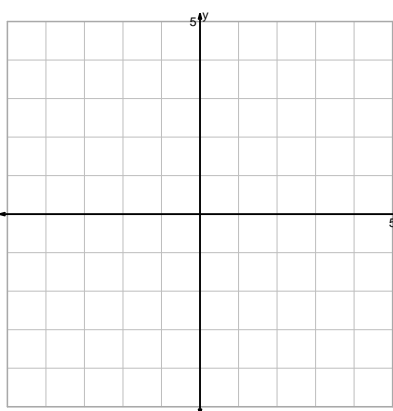$y = 2^x + 2$

$y = \left(2x\right)^3$

$y = \dfrac{\sqrt{x}}{2}$
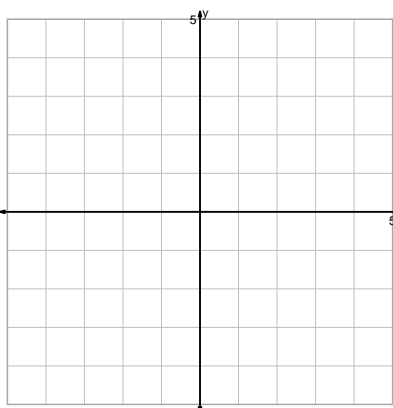
$y = -2^x$
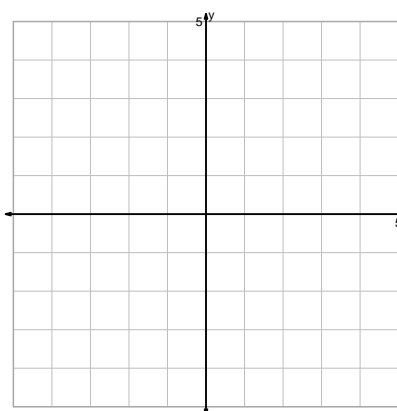
$y = \left(x+2\right)^2$

$y = \sqrt[3]{x} - 2$
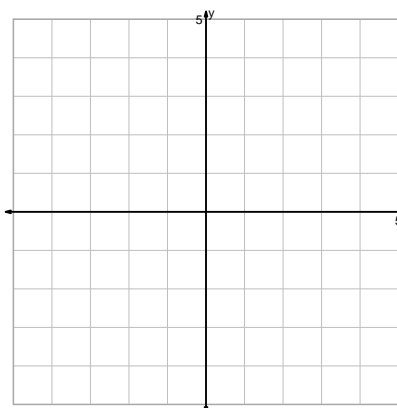
$y = \log_2\left(-x\right)$
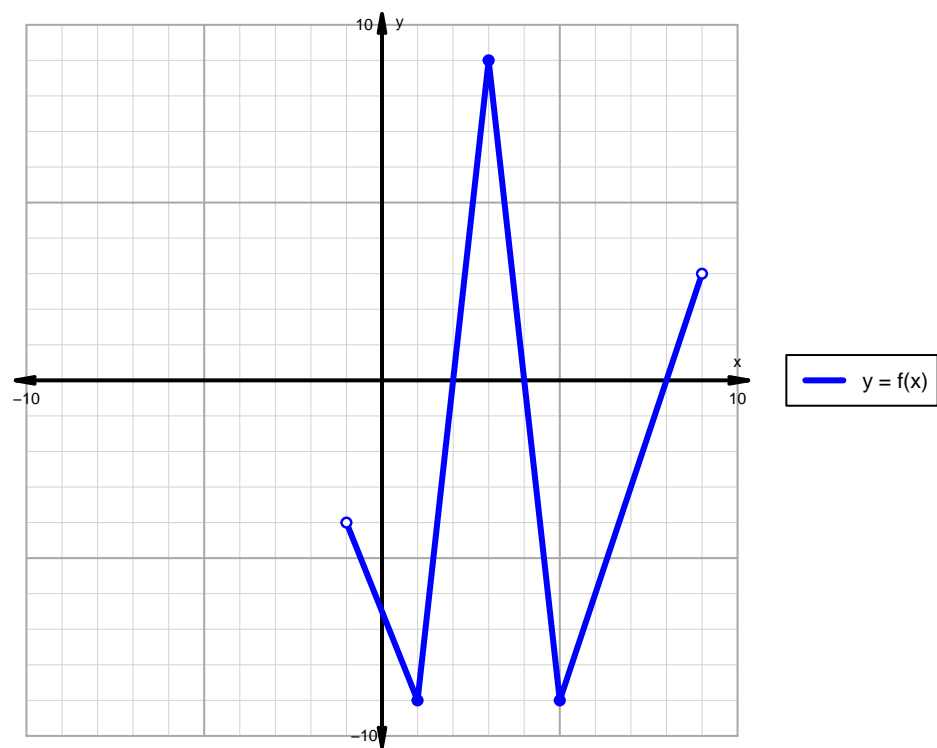
Question 3 (20 points)

A function is graphed below.

Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = 3 \cdot \left(f\left[\frac{x+5}{2}\right] - 4\right)$ are represented below in a table and on graphs.

a	b	x	y
-42	14	-89	30
-27	3	-59	-3
-9	-29	-23	-99
32	23	59	57

$b = f[a]$

$y = 3 \cdot \left(f\left[\frac{x+5}{2}\right] - 4\right)$
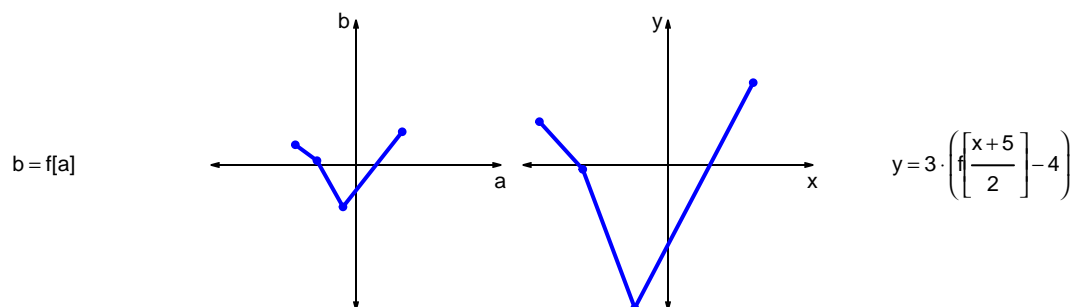
a. Write formulas for calculating x from a and calculating y from b. (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = 3 \cdot \left(f\left[\frac{x+5}{2}\right] - 4\right)$?

Question 5 (10 points)

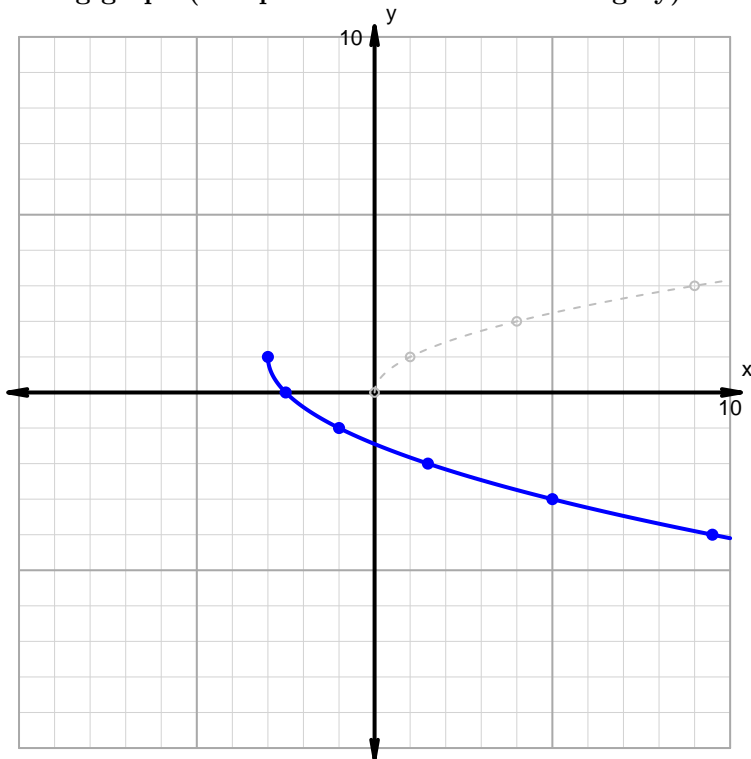A parent square-root function is transformed in the following ways:

Horizontal transformations

1. Horizontal shrink by factor 2.
2. Translate left by distance 3.

Vertical transformations

1. Translate down by distance 1.
2. Vertical reflection over x axis.

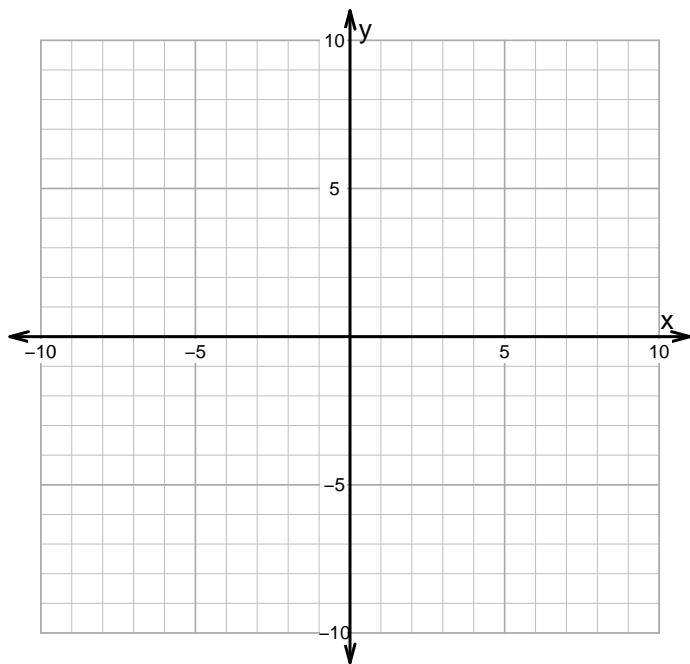**Resulting graph (and parent function in dashed grey):**

- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y = \frac{1}{3} \cdot |x + 6| - 1$$

Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	